Biotest
From Nature for Life

APC ErgoTouch

Airborne Particle Counter

ET-1.0 en
January 2009

Operation and Service Manual
(English)

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ET-1.0 en
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CERTIFIED ISO 9001:2000

Manual History

The following is a manual history of the APC ErgoTouch Airborne Particle Counter:

Revision	Date
A	November 2008
ET-1.0 en	January 2009
ET-1.0 de	January 2009

Warranty

Revision	ET-1.0 en / January 2009
Copyright	©Biotest AG / 2009 / All rights reserved.
Address	Biotest AG, Technology Center Microbiology, Wernher von Braun Straße 9, 69214 Eppelheim, Germany
E-mail Address	HYCON@biotest.de
Limitation of Warranty and Liability	Seller warrants the goods sold hereunder, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for (12) months, or the length of time specified in the operator's manual, from the date of shipment to the customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions: a. Parts repaired or replaced as a result of repair services are warranted to be free from defects in workmanship and material, under normal use, for 90 days from the date of shipment. b. Seller does not provide any warranty on finished goods manufactured by others or on any fuses, batteries or other consumable materials. Only the original manufacturer's warranty applies. c. Unless specifically authorized in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, goods which are incorporated into other products or equipment, or which are modified by any person other than Seller. The foregoing is IN LIEU OF all other warranties and is subject to the LIMITATIONS stated herein. **NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE**. TO THE EXTENT PERMITTED BY LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF SELLER'S LIABILITY FOR ANY AND ALL LOSSES, INJURIES, OR DAMAGES CONCERNING THE GOODS (INCLUDING CLAIMS BASED ON CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) SHALL BE THE RETURN OF GOODS TO SELLER AND THE REFUND OF THE PURCHASE PRICE, OR, AT THE OPTION OF SELLER, THE REPAIR OR REPLACEMENT OF THE GOODS. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES. SELLER SHALL NOT BE RESPONSIBLE FOR INSTALLATION, DISMANTLING OR REINSTALLATION COSTS OR CHARGES. No action, regardless of form, may be brought against Seller more than 12 months after a cause of action has accrued. The goods returned under warranty to Seller's factory shall be at Buyer's risk of loss, and will be returned, if at all, at Seller's risk of loss. Buyer and all users are deemed to have accepted this LIMITATION OF WARRANTY AND LIABILITY, which contains the complete and exclusive limited warranty of Seller. This LIMITATION OF WARRANTY AND LIABILITY may not be amended, modified or its terms waived, except by writing signed by an Officer of Seller.
Service Policy	Knowing that inoperative or defective instruments are as detrimental to Biotest as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call Biotest's Customer Service department at +49 (0) 6103 801 496
Trademarks	APC, ERGOTOUCH, ERGOTOUCH PRO and ERGOTRAK are trademarks of Biotest AG. Biotest and the Biotest logo are trademarks of Biotest AG. Microsoft and Excel are registered trademarks of Microsoft Corporation.

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Safety Information

This section gives instructions to promote safe and proper handling of the APC ErgoTouch airborne particle counters.

I M P O R T A N T
There are no user-serviceable parts inside the instrument. Refer all repair and maintenance to a qualified factory-authorized technician. All maintenance and repair information in this manual is included for use by a qualified factory-authorized technician.
Any attempt to open or service the instrument by non-authorized agencies or personnel will void the warranty.

Laser Safety

The APC ERGOTOUCH Airborne Particle Counter is a handheld Class I laser- based instrument.

- During normal operation, the user will ***not*** be exposed to laser radiation.
- Precaution should be taken to avoid exposure to hazardous radiation in the form of intense, focused, visible light.
- Exposure to this light may cause blindness.

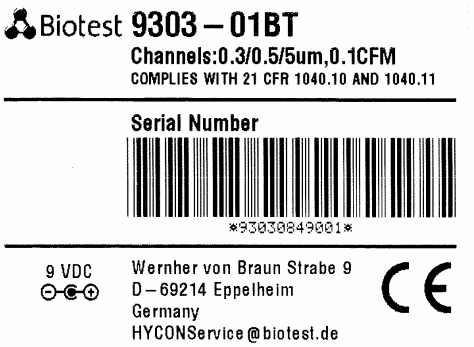
Take these precautions:

- ***DO NOT*** remove any parts from the particle counter unless you are specifically told to do so in this manual.
- ***DO NOT*** remove the housing or covers. There are no user-serviceable components inside the housing.

W A R N I N G
The use of controls, adjustments, or procedures other than those specified in this manual may result in exposure to hazardous optical radiation.

Labels

Advisory labels and identification labels are attached to the outside of the particle counter housing and to the optics housing on the inside of the instrument:

1. Serial Number Label (back panel)	
2. Laser Radiation Label (internal)	**DANGER!** VISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM WARNING: NO USER SERVICABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL
3. European symbol for non-disposable item. Item must be recycled.	

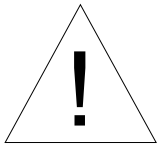
Description of Caution/Warning Symbols

Appropriate caution/warning statements are used throughout the manual and on the instrument that require you to take cautionary measures when working with the instrument:

Caution

C a u t i o n
Failure to follow the procedures prescribed in this manual might result in irreparable equipment damage. Important information about the operation and maintenance of this instrument is included in this manual.

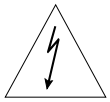
Warning



W A R N I N G
Warning means that unsafe use of the instrument could result in serious injury to you or cause damage to the instrument. Follow the procedures prescribed.

Caution or Warning Symbols

The following symbols may accompany cautions and warnings to indicate the nature and consequences of hazards:

	Warns that uninsulated voltage within the instrument may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make contact with any part inside the instrument.
	Warns that the instrument contains a laser and that important information about its safe operation and maintenance is included in the manual.
	Warns that the instrument is susceptible to electro-static dissipation (ESD) and ESD protection procedures should be followed to avoid damage.
	Indicates the connector is connected to earth ground and cabinet ground.

Getting Help

To obtain assistance with this product or to submit suggestions, please contact Biotest Customer Service, Biotest Technology Center Microbiology, or your local Biotest representative or service center:

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Chapter 1
Introduction and Unpacking

The APC ERGOTOUCH Airborne Particle Counter is a lightweight, handheld particle counter with a backlit LCD display. It operates on the included lithium-ion battery or AC power.

The device has a 0.1 ft^3 / min (2.83 L / min) flow rate and counts bin sizes from 0.3 to 5 µm (middle bin size is user-adjustable to 0.5 / 1.0 / 2.0 / or 2.5 µm). Up to 1,500 data sets can be downloaded for analysis and reporting using the ERGOTRAK LITE Data Download Software included with the device.

Typical applications for this particle counter include clean room monitoring, research, exposure assessment, indoor air quality, filter testing, clearance testing, quality assurance, and contaminant migration studies. All APC ERGOTOUCH airborne particle counters meet the JIS B 9921: 1997 standard.

Unpacking the APC ErgoTouch Airborne Particle Counter

Carefully unpack the APC ERGOTOUCH airborne particle counter from the shipping container and verify that all the items shown in the photos below and listed in the following tables are present. Contact your local Biotest representative immediately if items are missing or broken:

APC ERGOTOUCH Airborne Particle Counter Standard Included Items

Qty.	Item Description	Part/Model	Reference Picture
1	APC ERGOTOUCH Airborne Particle Counter	942 500	
1	AC Power Supply with country-specific plug adapters	942 512 (included)	
1	Isokinetic Inlet	942 602 (included)	
1	Battery Pack	942 511 (included)	
1	Computer Cable, USB A to mini-B	191 550 (included)	

Qty.	Item Description	Part/Model	Reference Picture
1	Purge Filter Assembly (HEPA)	942 601 (included)	
1	ERGOTRAK LITE data download utility CD (includes Operation and Service Manual)	(included)	(not shown)
1	Operation and Service Manual	(included)	(installed on CD)
1	Calibration Certificate	(included)	(not shown)
1	Quick Start Guide	(included)	(installed on CD)

Optional Accessories

The following photos and table list optional accessories. If you ordered optional accessories, make certain they have been received and are in working order:

APC ERGOTOUCH Airborne Particle Counter Optional Accessories

Item Description	Part/Model	Reference Picture
Custom Carrying Case	942 520	
Isokinetic Inlet SS	942 602	
Isokinetic Probe SS (remote sampling)	942 603	
Barbed Inlet (remote sampling)	191 824	
Tubing, 30 m / 100 ft (remote sampling)	191 822	

Item Description	Part/Model	Reference Picture
Compressed Gas Adapter (CGA)	942 675	
CGA Nozzle Set (ErgoTouch)	942 680	(not shown)

Chapter 2
Getting Started

This chapter provides information to help you use the APC ERGOTOUCH Airborne Particle Counter including:

- providing power
- performing a daily check
- installing an isokinetic inlet

Installing the Isokinetic Inlet

The isokinetic inlet smoothly accelerates air into the inlet of the instrument. To install, simply thread the inlet directly onto the inlet nozzle until finger tight. The inlet seals over an o-ring so it doesn't have to be very tight to seal.

Providing Power

The APC ERGOTOUCH may be powered using a removable rechargeable lithium-ion battery, or through an AC power cord.

Notes:

- When using AC power, the battery (if installed) charges when the instrument is on, but not while actively sampling.
- Removing / changing the lithium-ion battery or disconnecting the AC power does not cause loss of data.
- The battery should be fully charged before use to provide optimum performance.

To Install the Lithium-ion Battery

1. The battery is shipped separately and must be installed before use.
2. Remove the battery cover on the back side of the handle with a small, flathead screwdriver.
3. Connect the battery to the socket as shown below.

4. Insert the battery with the connector at the top and replace the battery cover. Make sure all wires are inside and not pinched in the cover. Do ***not*** over tighten the screw
5. Fully charge the battery before use.

W A R N I N G
The battery supplied by Biotest has built in protection against explosion and fire hazard. Do ***not*** use a substitute.

W A R N I N G
Do ***not*** use non-rechargeable batteries in this instrument. Fire, explosions, or other hazards may result.

To Use AC Power

1. Remove the AC transformer parts from their package and identify the appropriate plug adapter for your needs. Plug adapters are available for all common connections.
2. Remove the insert from the transformer using the slide lock and tilt the insert out.

3. Tilt the appropriate plug adapter into the transformer receptacle and make certain it locks into place.

4. Plug the DC end of the transformer cord into the particle counter.
5. Plug the AC end of the transformer cord into an AC outlet.
6. The Power LED lights when the battery is charging. When the Power LED is off, the battery is fully charged.
7. When the battery is charged, unplug the power supply

Performing a Daily Zero Check

A zero check should be performed at least once a day. It should also be performed before conducting any important testing or certification.

To Perform a Zero Check

Turn on the instrument and wait until the main menu appears.

1. Remove the isokinetic inlet if attached. The daily zero check cannot be performed when the isokinetic inlet is attached to the instrument.
2. Attach the zero filter to the inlet nozzle located on the top of the instrument.
3. Press the **Start** button and allow the instrument to purge for 2 minutes.
4. After the 2-minute purge, continue to sample. In accordance with JIS standards, there should be no more than 1 particle counted at any size in 5 minutes.

***Note**: If the instrument does not go to zero (1 particle in 5 min is considered zero), refer to Chapter 6, Troubleshooting, for additional information.*

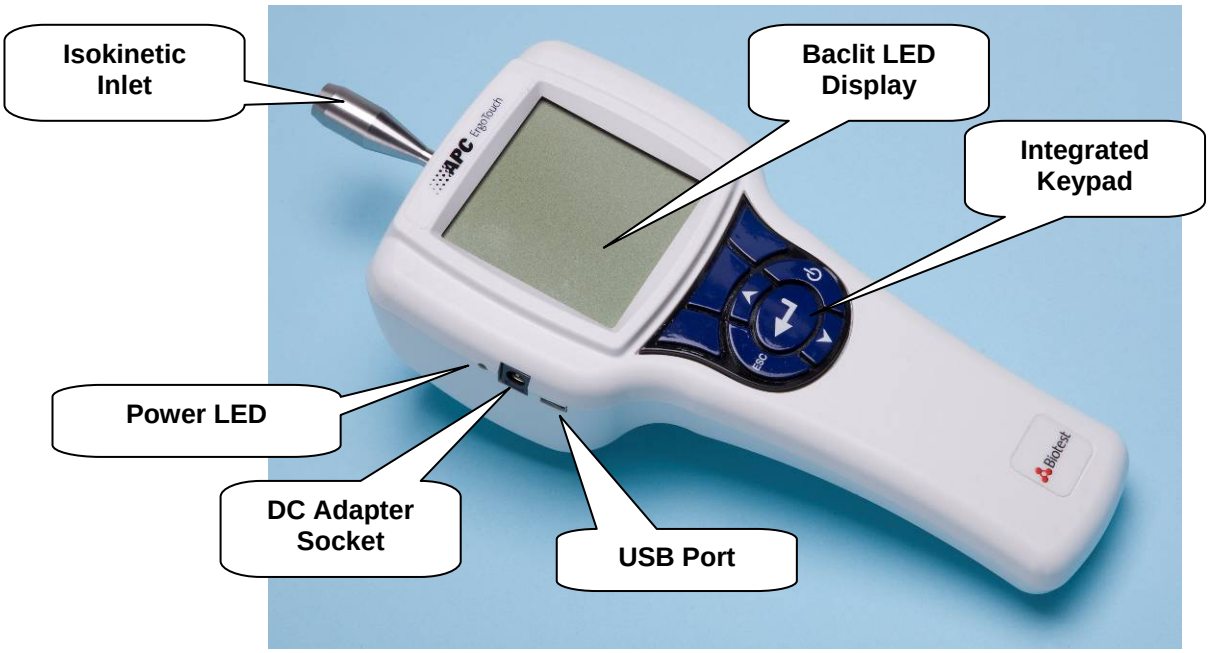
5. Remove the zero filter and put the isokinetic inlet back on; the instrument is now ready for operation.

Quick Start

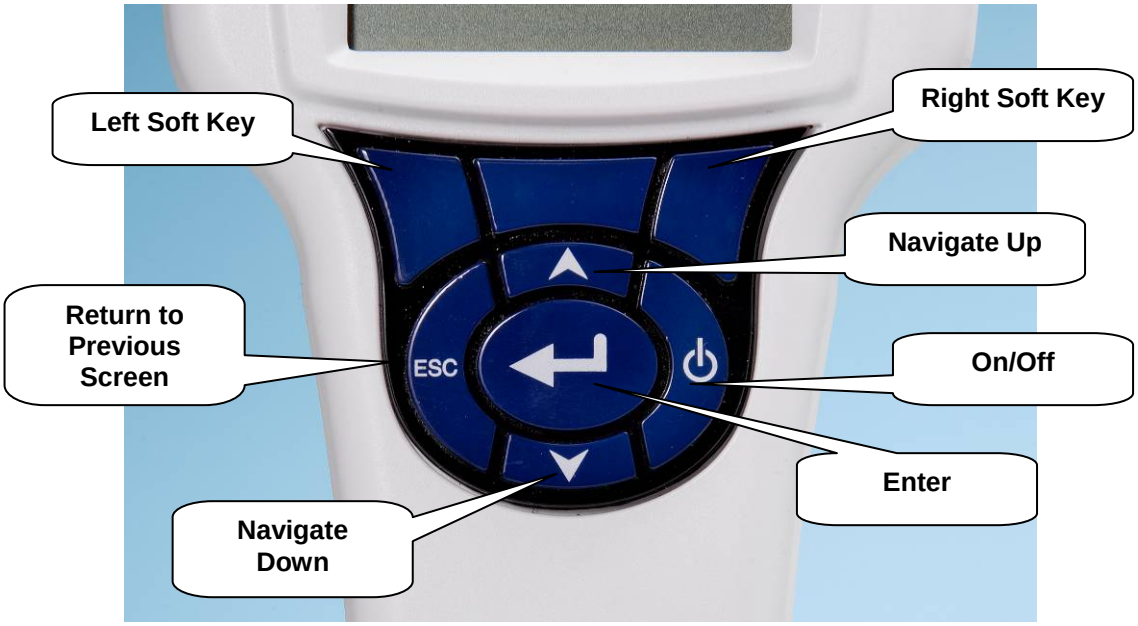
The best way to quickly get started is to refer to the laminated "Quick Start Guide" included with your particle counter. It will help you to quickly set up the instrument and begin sampling. Refer to the sections below for more detailed information on configuring and running the instrument.

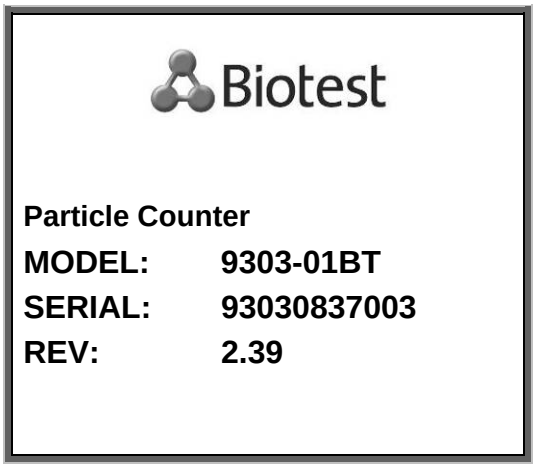
Chapter 3
Operation

The APC ERGOTOUCH Airborne Particle Counter is controlled using the integrated keys and the backlit display.

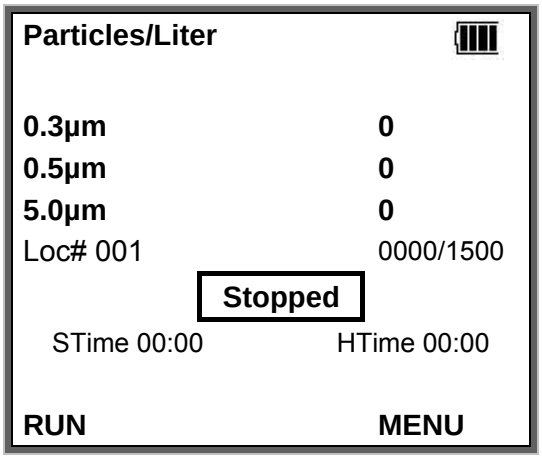


To turn on the instrument, press the **On/Off** button (located on the right side of the integral keys). A splash screen will appear for approximately three seconds, displaying the Biotest logo, model number, serial number, and firmware version number.





The instrument is ready for operation when the default screen (shown right) appears.



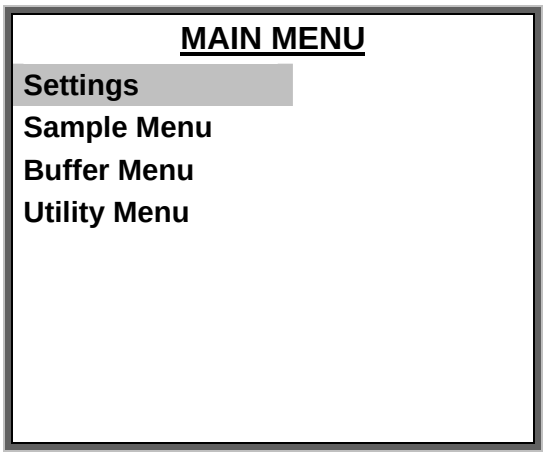
Note: To turn off the instrument, press and hold the **On/Off** key for four seconds. The instrument then turns off.

Warm-up Time

An initial warm-up period of 15 minutes is recommended before sampling with the APC ERGOTOUCH Airborne Particle Counter. The warm-up period allows time for the optics to reach a steady-state temperature. This will have the effect of more reproducible results. Neglecting the warm-up time may result in overestimation of particle size (approximately 10 %). Neglecting the warm-up time will not have a significant effect on particle concentration, therefore, a zero count can still be performed without waiting for the warm-up period.

Main Menu and Basic Operation

Press **MENU** on the Default Screen to enter and display the main menu.

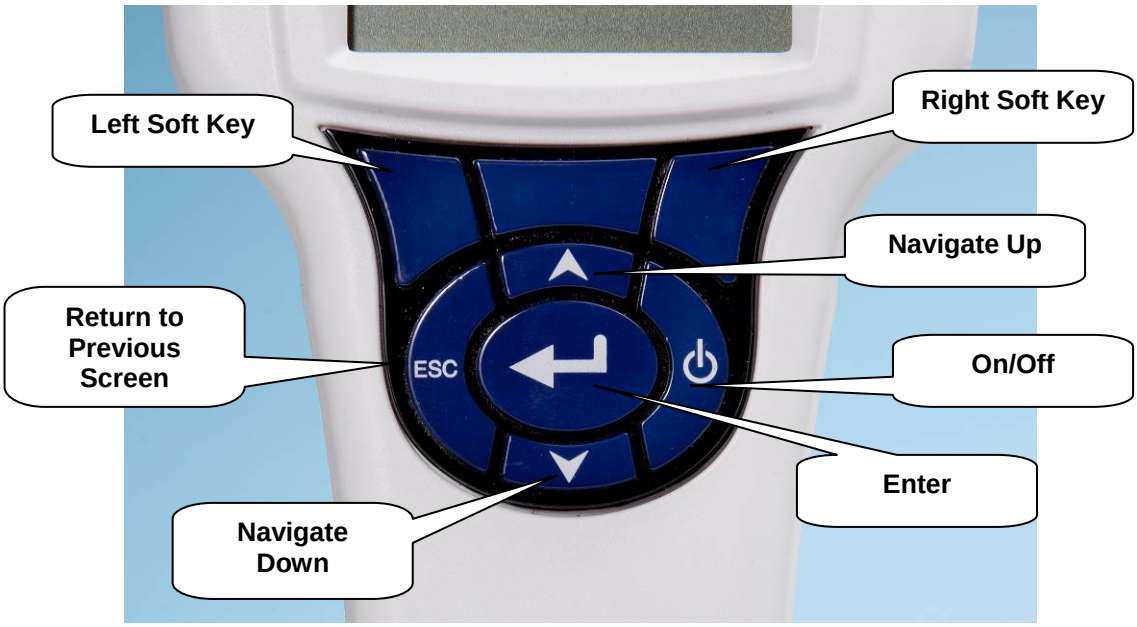


Menu	Settings
Settings	Set language (initially English only), time and date, time and day format, and screen settings
Sample	Set sample mode, cycle mode, sample time, hold time, cycle count, sample units, and middle channel size
Buffer	View the number of records stored in the APC ERGOTOUCH, display buffer records, and clear the buffer
Utility	Adjust the pump speed, turn data logging on and off, and select the sampling location

Basic Operation

This section explains the basic operation using the integrated keypad and starting sampling.

Using the Keypad



Use the **Up** and **Down** keys to highlight a menu or a menu option, then:

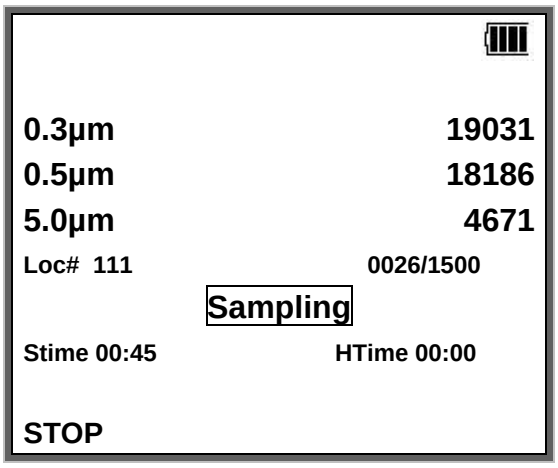
- If **Left** and **Right** arrows appear at the bottom of the screen, use **Left Soft Key** and **Right Soft Key** to select the option you want. Generally, there will be only two or three options. Soft keys change function depending on the display above them. The **Center Soft Key** is not currently used.
- If no arrows appear at the bottom, press the **ENTER** key to bring up a secondary window from which you can make a selection or modify a setting.

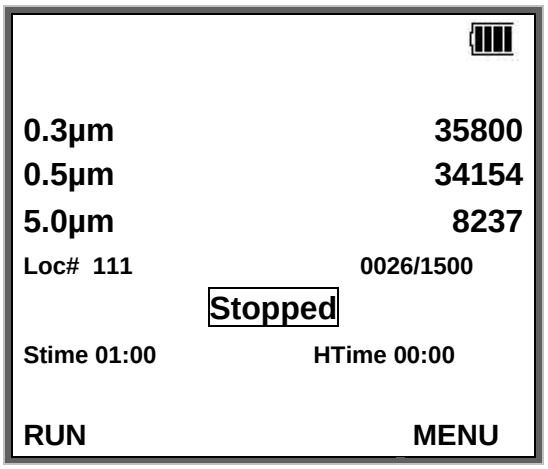
Use the **Up** and **Down** keys to perform operations such as increasing or decreasing a value. Use the **Right Soft Key** and **Left Soft Key** to move right and left.

The **ESC** key always brings you back to the previous screen.

Start Sampling

To start sampling, press the **Left Soft Key** (below **"RUN"**). The APC ERGOTOUCH begins collecting samples immediately if set to manual mode, or according to the parameters that have been set for automatic mode.



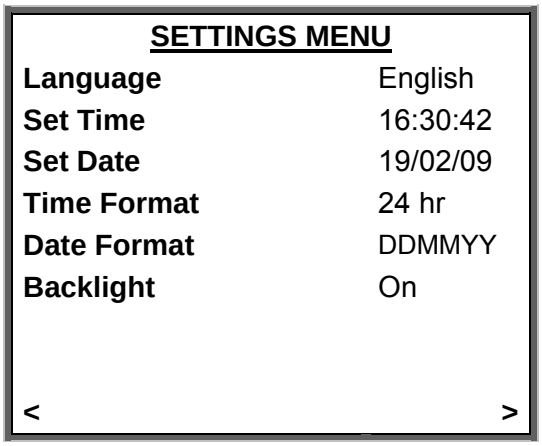


To stop sampling at any time, press the **STOP** key.

Settings Menu

The settings menu allows the user to set language (currently English only), current time and date, select the time and day format, and set certain screen settings.

The table below describes the options of this menu and the parameters which can be set.

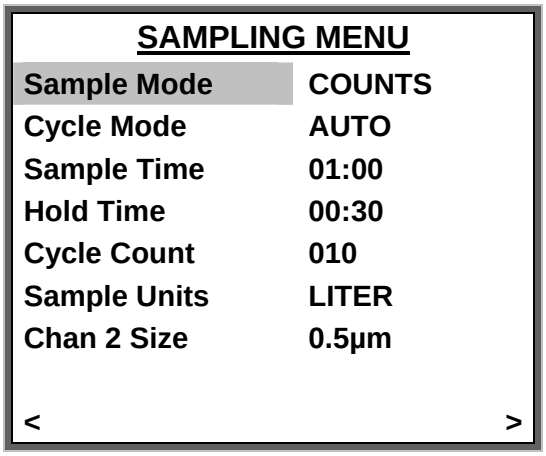


Option	Description	Parameters
Language	Use **<** and **>** to set the language in which information is displayed	English only (other languages may be offered at a later date)
Set Time	Press the **Enter** key to go to a secondary screen where you can set current time	Hours, minutes, seconds
Set Date	Press the **Enter** key to got to a secondary screen where you can set the current date	Day, month, year
Time Format	Use **<** and **>** to set the time format in which time is displayed and saved in the data records	12 hr. 24 hr
Date Format	Use **<** and **>** to set the date format in which date is displayed and save in the data records	DD/MM/YY, MM/DD/YY
Backlight	Use **<** and **>** to set whether the backlight on the display is on or off. ***Note:*** Battery life is shorter with the backlight enabled	ON – backlight is always on OFF – backlight is always off

Sample Menu

The sample menu sets sample mode, cycle mode, sample time, hold time, cycle count, sample units, and middle channel size.

The table below describes the options of this menu and the parameters which can be set.

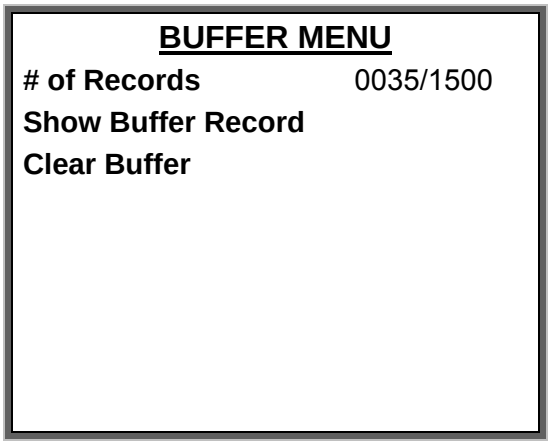


Option	Description	Parameters
Sample Mode	Use **<** and **>** to set the sampling mode	Concentration, Counts
Cycle Mode	Use **<** and **>** to set the cycle mode	Manual – the counter will start when the **RUN** soft key is pressed and stop only when the **STOP** soft key is pressed. Auto – the counter will start when the **RUN** soft key is pressed and turn on and off automatically to follow the parameters set below.
Sample Time	Press the **Enter** key to got to a secondary screen where you can set the sample time	Minutes, Seconds
Hold Time	Press the **Enter** key to got to a secondary screen where you can set the hold time between samples	Hours, Minutes, Seconds
Cycle Count	Press the **Enter** key to got to a secondary screen where you can set the number of samples to take	1 – 999
Sample Units	Use **<** and **>** to set the sampling units	Liter, Cubic Feet
Channel 2 Size	Use **<** and **>** to set the bin size for the middle channel (channel 2). This is the only channel that can be set to multiple values	0.5, 1.0, 2.0, 2.5 µm

Buffer Menu

The buffer menu allows the user to view the number of records stored in the APC ERGOTOUCH, display buffer records and clear the buffer.

The table below describes the options of this menu and the parameters which can be set.



Option	Description	Parameters
# of Records	Shows the number of sample data records stored on the APC ERGOTOUCH	None
Show Buffer Record	Press the **ENTER** key to go to a secondary screen in which the sample data record can be selected for viewing. This is selected by sample number. Use the **Soft Keys** to browse through the data records	Any number from 1 to the total number of data records in memory (1 – 1 500 maximum)
Clear Buffer	Press the **ENTER** key to clear all sample data records in the buffer. You will be prompted to confirm the request	None

At right is an example of a buffer record.

BUFFER RECORD

Record#:	0313
Date:	01/27/08
Time:	05:50:45
0.3µm	000566473
0.5µm	000534571
5.0µm	000072056
Location:	111
Sample Time:	01:00
Hold Time:	00:00
<	**>**

Utility Menu

The utility menu lets you adjust the pump speed, turn data logging on and off, and select the sampling location.

The following table describes the options of this menu and the parameters which can be set.

UTILITY MENU

Pump Speed	099
Data Logging	ON
Location	001

C a u t i o n
If data logging is turned off, no sample data records will be saved to the buffer.

Option	Description	Parameters
Pump Speed	Press the **ENTER** key to go to a secondary screen where the pump speed can be increased or decreased. The pump may slow down with age, or it may be necessary to increase the speed if there are flow restrictions such as long tubing. Use a flowmeter to check the flow when taking critical measurements and adjust the pump speed as necessary.	0 – 255
Data Logging	Use **<** and **>** to turn data logging on and off	ON, OFF
Location	Press the **ENTER** key to go to a secondary screen where a location can be selected (by number)	0 - 255

Chapter 4
Data Handling

USB Computer Communication

The APC ERGOTOUCH Airborne Particle Counter is equipped with a USB compatible cable for uploading and downloading information to a PC. The cable plugs into the left side of the instrument as shown below (mini-B).

Installing Software

The ERGOTRAK LITE data transfer utility comes on a CD that loads software and communications drivers for the particle counter. The CD also contains the Operations Manual and Quick Start Guide. To install the software, insert the CD into your computer drive and follow the instructions. Installation consists of two parts:

Installation of ERGOTRAK LITE data download utility:

- Run **setup.exe** from the provided CD and follow on-screen instructions.

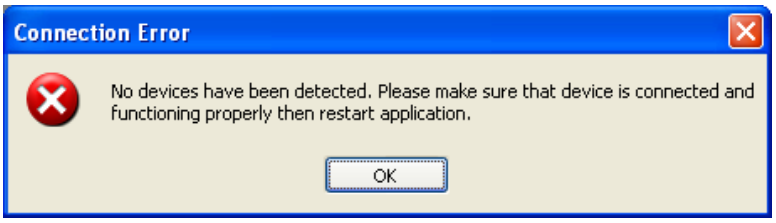
Installation of FTDI Virtual Serial Port driver:

- This installation is executed transparently during the setup process and does not require user input. Once installation is finished, drivers are ready for use.
- Restart the computer for changes to take effect.
- When the APC ERGOTOUCH particle counter is connected for the first time, system will automatically detect the device and locate installed drivers.

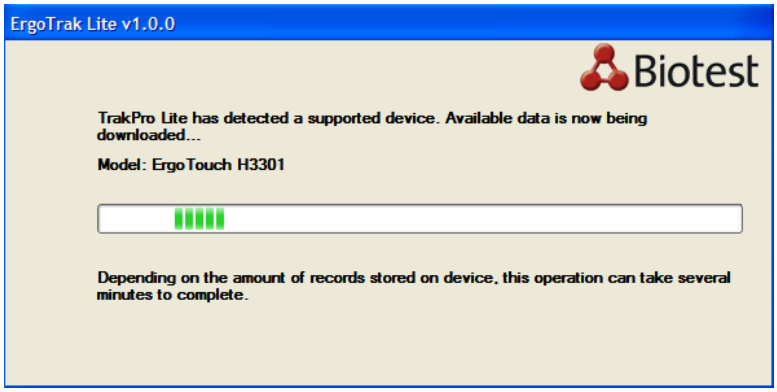
Download Data

To transfer data from an instrument to a computer via the USB connection for further analysis and report generation:

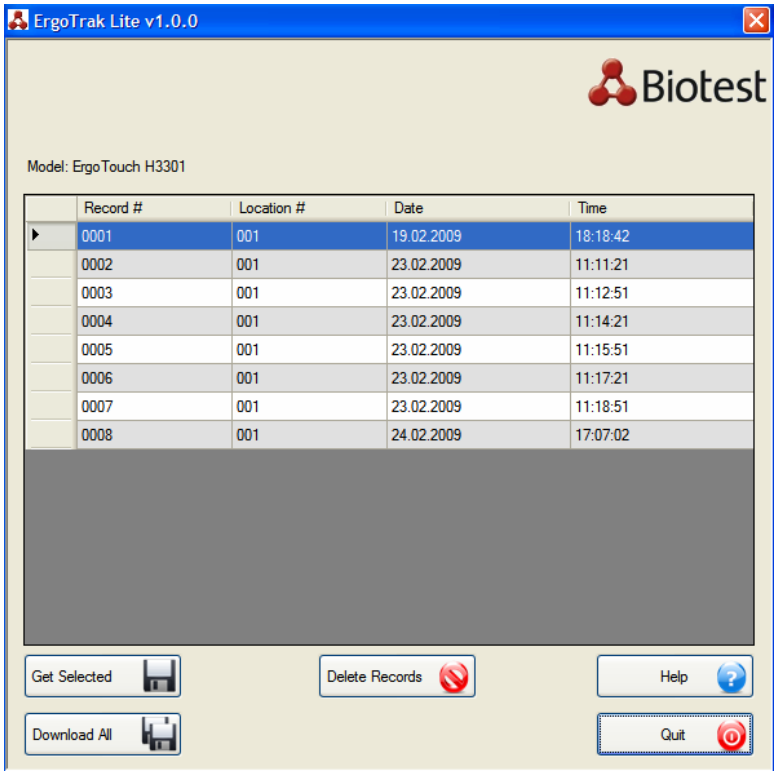
- Make sure that APC ERGOTOUCH PRO particle counter is attached to the computer and turned on.
- Start the application. If the APC ERGOTOUCH particle counter is not connected or discovered by the application, the following message appears:


Connection Error
No devices have been detected. Please make sure that device is connected and functioning properly then restart application.
OK

- Make sure that the APC ERGOTOUCH particle counter is connected, turned on, and functioning properly. Restart the application.
- If communication with ERGOTOUCH particle counter has been established, the following screen appears:

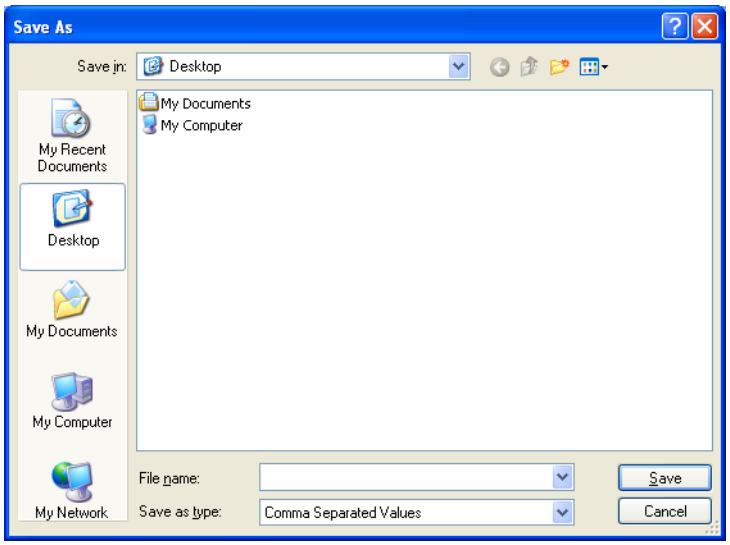

ErgoTrak Lite v1.0.0
Biotest
TrakPro Lite has detected a supported device. Available data is now being downloaded...
Model: ErgoTouch H3301
Depending on the amount of records stored on device, this operation can take several minutes to complete.

- Once data is successfully downloaded, the main application screen will appear:



1. There are two options for downloading data:
    - Download only user selected records:
      Hold down the **CTRL** key and use the mouse to click on the records you want to retrieve. When you have selected the records, press the **Get Selected** button to retrieve only the selected records from the device.
    - Download all records:
      Press the **Download All** button to retrieve all the records from the device.

2. After you press either the **Get Selected** or **Download All** buttons, the following dialog appears to allow you to select the folder where data will be saved:

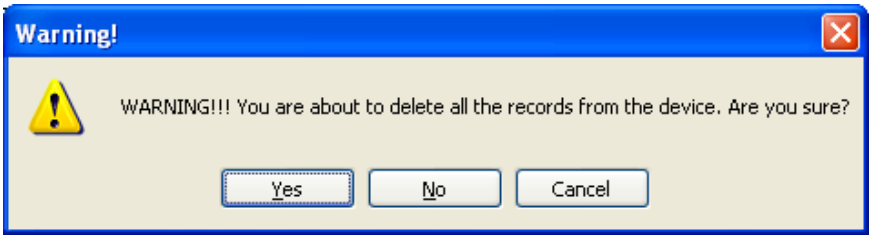


- To cancel the data transfer, select **Cancel**
- To accept the data transfer, enter the file name under which data will be saved and select **Save**.
- Data is stored in a .CSV file that can be opened by most spreadsheet programs such as Microsoft® Excel® spreadsheet software.

Delete Data

In order to delete data from the device click **Delete Records** button. The following warning will appear:

If **Yes** is selected, ERGOTRAK LITE software will erase data from the device and also from application memory.



W A R N I N G
Deleting data is an irreversible operation. Download and save data *before* deleting in order to have a copy for future use.

Chapter 5
Maintenance

N o t e
There are no user-serviceable parts inside this instrument. Opening the instrument case may void the warranty. Biotest recommends that you return the APC ERGOTOUCH Airborne Particle Counter to the factory for any required maintenance or service not described in this manual.

Maintenance Schedule

Biotest recommends annual factory cleaning and calibration for the APC ERGOTOUCH Airborne Particle Counter. See Chapter 7, "Contacting Customer Service" for service/calibration.

Recommended Field Maintenance Schedule

Item	**Frequency**
Daily zero check	Daily (or before each use).
Factory cleaning and calibration	Annually
Cleaning the instrument enclosure	As needed

Daily Zero Check

The daily zero check ensures that the instrument is properly assembled and free from leaks, residual particles and electronic noise. Please see Chapter 2, “Getting Started” for detailed instructions on performing the zero check.

Cleaning the Instrument Enclosure

To clean the enclosure, dampen a lint-free cloth and gently wipe the surface until surface contamination is removed.

Chapter 6
Troubleshooting

Symptom	Possible Cause	Corrective Action
Counts are too low	• Instrument is being operated outside temperature or relative humidity specifications.	• Operate instrument within specifications
	• Internal parts have been damaged because instrument was stored at a temperature greater than 122 °F (50 °C).	• Return to factory for service
	• Instrument has contamination on the optics due to condensation or excessive loading	• Return to factory for service
	• Laser or pump control is damaged	• Return to factory for service
	• Unit is due for calibration	• Return to factory for service
Instrument does not turn on	• On/Off switch is not being pressed appropriately	• Press and hold On/Off switch for one second
	• Battery is dead	• Recharge battery or connect to AC power
	• AC cord is not plugged into unit	• Connect AC cord
Instrument does not meet zero count specification (≤1 particle/5 mins)	• HEPA filter is not connected properly and room air is leaking into the HEPA filter assembly	• Check that the HEPA filter has been tightly connected to the inlet. Check that rubber o-ring (black) on the inlet is in place
	• Residual particles from previous samples are shedding off internal parts and into the optics	• Purge instrument by running the instrument for 10–15 minutes before attempting zero count test
	• An internal component has been damaged due to operation outside of temperature specifications or one ore more excessive bumps or jolts, and electronic noise is inducing false counts	• Return to factory for service
	• A leak has developed in the aerosol flow path	• Return to factory for service
	• Internal optics have become dirty	• Return to factory for service

Battery does not charge	• The unit must be turned on but not in sampling mode for the battery to charge	• Turn on unit
Low Battery Indicator	• Low Battery charge	• Recharge the battery or connect AC power

Chapter 7
Contacting Customer Service

This chapter gives directions for contacting people at Biotest AG for technical information and directions for returning the APC ERGOTOUCH Airborne Particle Counter for service.

Technical Contacts

- If you have any difficulty setting up or operating the APC ERGOTOUCH, or if you have technical or application questions about this system, contact an applications engineer at Biotest AG, +49 (0) 6221 726 5130 or e-mail hycon@biotest.de.
- If the APC ERGOTOUCH, does not operate properly, or if you are returning the instrument for service, contact Biotest Customer Service at +49 (0) 6103 801 496 or email mail@biotest.de.
- Call your local Biotest Subsidiary or Representative.

Returning the APC ERGOTOUCH Airborne Particle Counter for Service

First contact your local Biotest representative to make arrangements. If you don't know or don't have a Biotest representative, you can contact Biotest directly:

Visit our website at http://www.biotest.com or call Biotest Technical Support at +49 (0) 6221 726 5130 or Biotest Customer Service at +49 (0) 6103 801 496 for specific return instructions. Customer Service will need this information when you call:

- The instrument model number
- The instrument serial number
- A purchase order number (unless under warranty)
- A billing address
- A shipping address

All instruments must be properly decontaminated prior to packing and return to Biotest. Use the original packing material to return the instrument to Biotest. If you no longer have the original packing material, seal off any ports to prevent debris from entering the instrument and ensure that the display and any connectors on the instrument as well as the front and back panels are protected.

APPENDIX A
Specifications

All specifications meet or exceed JIS B 9921: 1997. They are subject to change without notice.

Size Range	0.3–10 µm
Channel Sizes	0.3 and 5.0 µm fixed, 0.5, 1.0, 2.0 or 2.5 µm user-selectable middle channel
Counting Efficiency	50 % @ 0.3 µm; 100% for particles > 0.45 µm (per JIS)
Concentration Limits	2,000,000 particles/ft^3 @ 5 % coincidence loss
Light Source	Laser diode
Zero Count Level	≤ 1 count / 5 minutes (< 2 particles / ft^3) Meets JIS B 9921:1997
Flow Rate	0.1 CFM (2.83 L/min)
Calibration	NIST traceable
Sample Probe/Tubing	Isokinetic sampling probe
Sampling Time	1 second to 99 min 59 sec
Sampling Frequency	1 to 999 cycles or continuous
Sample Output	Internal HEPA filter
Vacuum Source	Internal dual diaphragm pump
Communication Mode	USB serial output
Data Storage	1,500 sample records
Alarm	Audible alarm on counts, low battery and sensor failure
Display	9.1 cm (3.6 in) 160 x 160 monochrome backlit LCD
Languages	English
External Surface	High impact injection molded plastic
Power	110 to 240 VAC 50 to 60 Hz Universal in-line power supply with country-specific plug adapters
Battery	Removable Li-Ion
Battery Life	Up to 2 hours of continuous use
Recharge Time	< 3 hours
Dimensions (L x W x H)	23.0 x 11.0 x 6.2 cm (9.1 x 6.3 x 2.4 in)
Weight	0.58 kg (1.3 lb) with battery
Warranty	12 months
Operating Conditions	5 °C to 35 °C; 20 % to 95 % non-condensing relative humidity
Storage Conditions	0 °C to 50 °C; Up to 98 % non-condensing relative humidity
Included Accessories	Power supply, battery, isokinetic inlet, purge filter, ERGOTRAK LITE data download software, operation manual on CD, USB computer cable, calibration certificate, and Quick Start Guide.
Optional Accessories	Stainless steel isokinetic inlet and probe, tubing, barbed inlet fitting and carrying case